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BRIEFLY

Census Bureau estimates of state median household income are unreliable.

Household Income Estimates Unreliable

The press has given prominent coverage to a recent Census Bureau report showing a dramatic drop in the income of the average Washington state household. The survey upon which this report was based, however, included only 623 Washingtonians. This number is too small for the estimate of income to be reliable. All other indicators show Washington incomes have increased not decreased.

Chart 1 shows the Census Bureau's estimates of median household income for the years 1990 to 2000. The median is one of the statistical measures of "average." Half of all households have incomes above the median; half, below.

The median incomes are adjusted to constant year 2000 dollars using the CPI-U-RS, the new "research series using current methods" of the Consumer Price Index.¹

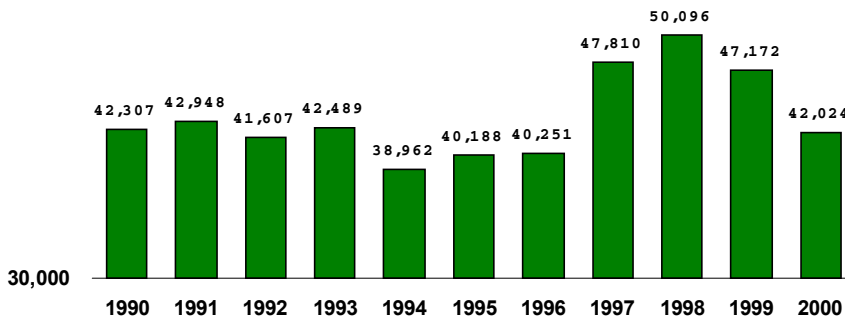
In 2000, the Census Bureau estimates, the median household income in Washington state was \$42,024.

These figures show an incredible variability. From 1993 to 1994, household income, by the Bureau's estimate, fell by \$3,527, 8.3 percent. From 1996 to 1998 it increased by \$9,845, 24.5 percent; from 1998 to 2000 it fell by \$8,072, 16.1 percent. These are huge movements; so large in fact that they cannot be correct. Incomes simply do not move that wildly.

Other measures of income have been much less volatile and do not show a decline for the last two years.

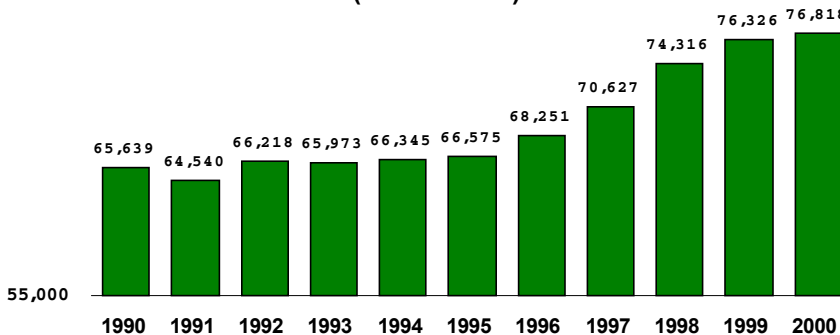
Chart 2 shows estimated mean household income for the state for the 1990 to 2000 period based on data from the Department of Commerce's Bureau of Economic Analysis. The mean is an alternate statistical measure of average, which divides the total

CHART 1
Median Household Income
(2000 dollars)



Source: Census Bureau, BLS; WRC calculations

CHART 2
Estimated Mean Household Income
(2000 dollars)



Source: BEA, OFM, BLS; WRC calculations



income of households by the number of households.² Again the incomes are adjusted to constant year 2000 dollars using the CPI-U-RS.

The estimated mean household income for the state was \$76,326.

The mean household incomes are greater than the median household incomes. This is to be expected because of the nature of the two statistical measures: the mean is pulled up by high income households to a much greater extent than is the median.

The estimated mean household income has increased in every year since 1993.

The pattern of changes in mean income are much more believable than those seen in the Census Bureau estimates of the median income. The increase from 1996 to 1998 mean income is \$6,065, quite a bit less than the increase in the Census Bureau's estimate of median household income. If anything, one would expect the mean to be up by more than the median over that period: One of the major factors driving up income in this period was stock option income in the software industry. But as this income represent very large gains for a fairly small number of people; it should have had a greater impact on mean income than on median.

The much greater volatility indicates that the Census Bureau's estimates of median state household incomes are not reliable.

A similar conclusion emerges if one examines the stability of Washington's ranking with respect to median household income. Chart 3 shows the ranking for the years 1990 to 2000. Washington's rank has jumped around considerably over the 11 years. For example, it leaped from 19th in 1996 to 4th in 1997. It dropped from 5th in 1998th to 14th in 1999 and then to 25th in 2000.

In contrast, as Chart 3 also shows, Washington's rank among the states in per capita personal income has been much less volatile. From 1995, when the state stood 18th, Washington's per capita personal income has risen steadily, reaching 11th in 2000.

The much greater volatility of the state's ranking with respect to median household income as compared to

mean income again points to the unreliability of the Census Bureau's state median income estimates.

The source of the unreliability is the fact that the Census Bureau surveys only a small number of Washingtonians in preparing these estimates.

The Current Population Survey (CPS) is a monthly survey of the U.S. population conducted by the Census Bureau for the Department of Labor's Bureau of Labor Statistics (BLS). The basic monthly survey focuses on obtaining information on the nation's civilian labor force. The monthly CPS is the source of the BLS's calculation of the nation's rate of unemployment.

Each year, the March CPS includes a major supplementary survey, the Annual Demographic Survey. This survey is the major source of information on the American population in the years between the decennial censuses. Estimated

CHART 3
Washington's Rank Among the 50 States In Household and Per Capita Income

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Median Household Income	11	9	12	12	19	18	19	4	5	14	25
Per Capita Personal Income	15	14	14	15	16	18	16	13	12	12	11

Source: Census Bureau, Office of the Forecast Council; WRC calculations



of median household income appear in *Money Income in the United States*, one of the reports that the Census Bureau produces annually based on the March CPS.

As a survey, the CPS is subject to sampling error and response error. Sampling error occurs when the sample of households surveyed do not accurately reflect the underlying population. Response error occurs when a subject provides an inaccurate answer to a survey question.

The survey sample includes about 50,000 households nationally. While this is large enough to provide reasonably accurate estimates of national median household income, the state median incomes are much less precisely estimated. For the March 2001 survey, the Census Bureau interviewed only 623 Washington state households.

The Census Bureau uses a two-year interval when comparing changes in median household incomes among states. Thus the just released study bases its comparisons on the difference between the 2000 median and the 1998 median for each state. For Washington, the estimated 2000 median household income was \$8,072 less than the 1998 median. Washington was one of 17 states to show a decrease, and Washington's was the largest decrease. And it was this fact that generated the newspaper articles.³

Recall from Chart 1 that the 1998-2000 drop in Washington's median household income followed an even larger increase in the 1996-1998 period. In fact, the Census Bureau's 1998 edition of *Money Income in the United States*, released two years ago, found that Washington had had the largest increase in median household income of all the states from 1996 to 1998.

Press coverage of that report was fairly skeptical. (The headline in the Seattle Times read *Don't order yacht yet; rosy wage data may be wrong.*) Economist Irv Lefberg of the state Office of Financial Management stated that Census Bureau's estimate of income growth was nearly twice what he had estimated. He expressed concern with the small size of the sample that the Census used in preparing its estimates. "There could be significant errors in those estimates. This is not a figure that we ourselves would have used."

Edward Welniak, a Census Bureau official acknowledged, "We have to be careful of the state level data. There's probably a large sampling unreliability."

Unfortunately, coverage of the most recent was much less skeptical.

The Seattle P-I ran a front-page article on the income report. This article prominently quoted one analyst – not a trained economist – who boldly declared the drop in household income "real." It is not real. This fellow then opined that the numbers meant that income distribution had worsened dramatically in the state: "it means that a larger percentage is much closer to the bottom of the income distribution than we thought." No. The Census Bureau finds no recent change in income inequality for the nation as a whole: "Regardless of the measure used, income inequality rose substantially between 1967 and the early 1990s, but has remained largely unchanged since then." There is no reason to believe the case is different in Washington state. For Washington state specifically, the reduction of stock option income has decreased inequality.

The state's chief economist, Chang Mook Sohn, was quoted near the end of the article. He pronounced the findings "highly suspicious" since they did not accord with any other economic indicator he had seen for the state. In a later press release, Dr. Sohn detailed a number of the contradictory indicators and



concluded “little confidence can be placed in the U.S. Census Bureau’s most recent estimate of Washington State real median household income growth. As such, the Office of the Forecast Council will not attempt to interpret the results in terms of real economic activity or policy implications.”

It is the correct conclusion.

(Endnotes)

- ¹ The Census Bureau recommends using this index. CPI-U-RS “attempts to answer the question, ‘What would have been the measured rate of inflation from 1978 forward had the methods currently used in calculating the CPI-U been in use since 1978?’” U.S. Census Bureau. <http://www.census.gov/hhes/income/income00/cpiurstxt.html>.
- ² We have estimated mean household income in this way. Personal income per capita for each year was calculated from Bureau of Economic Analysis income estimates and Office of Financial Management population estimates. Per capita income was then multiplied by OFM forecasts of average household size to get income per household.
- ³ Actually, the Census Bureau uses 2-year-average medians when comparing changes in median household incomes among states. Thus the just released study calculates for each state the difference between the average of the 1999 and 2000 medians and the average of the 1998 and 1999 medians. Application of some high school algebra shows that this difference is equal to $\frac{1}{2}$ of the difference between the 2000 median and the 1998 median.

References

- Cook, Rebecca, “Incomes here dropped most, Census reports.” Seattle Times, September 26, 2001.
- Gilmore, Susan, “Don’t order yacht; rosy wage data may be wrong” Seattle Times, October 1, 1999.
- Office of the Forecast Council, “Office of the Forecast Council Questions the Reliability of Census Median Income Report,” September 27, 2001.
- Schubert, Ruth, “State’s median income falls most in nation,” Seattle P-I, September 26, 2001.
- U.S. Census Bureau, Money Income in the United States, p 60-213, September 2001.



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